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ABSTRACT

This study was undertaken to evaluate the predictive validity of the Law School Admission Test (LSAT) earned under accommodated testing conditions. Of special interest was the validity of scores obtained by test takers who were accommodated under nonstandard time conditions (i.e., accommodations that included extra testing time). Separate predictive validity analyses were conducted for test takers classified as having Attention Deficit/Hyperactivity Disorder, Learning Disabilities, Neurological Impairment, and Visual Impairment. The measure used to assess the predictive validity of the LSAT for these groups was law school first year average (FYA). The predictive validity of the undergraduate grade point average was also evaluated, as was the combination of LSAT and UGPA. The sample was drawn from 590 entering law school classes from 168 law schools over 5 years. Results suggest that LSAT scores earned under accommodated testing conditions that included extra testing time are not comparable to LSAT scorers earned under standard timing conditions as evidenced by a tendency of the former to overpredict FYAs. Results for individual groups were consistent with the overall group result. The study also indicates that LSAT scores earned under standard timing conditions are comparable, regardless of whether other (nontiming related) accommodations are given. Results show that LSAT scores obtained under accommodated conditions that included extra testing time should be evaluated with care. (Contains 10 tables, 19 figures, and 20 references.) (SLD)

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■ Predictive Validity of Accommodated LSAT Scores

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Table of Contents

Executive Summary 1
Introduction 1
Sample Definition 2
Predictor and Criterion Variables 6
Descriptive Statistics 7
Residual Analyses 9
Decile Analyses 17
Matches Sample Analysis 25
Conclusions 32
References 33

Executive Summary

This study was undertaken to evaluate the predictive validity of Law School Admission Test (LSAT) scores earned under accommodated testing conditions. Of special interest was the validity of scores obtained by test takers who were accommodated under nonstandard time conditions (i.e., accommodations that included extra testing time). Within this group, separate predictive validity analyses were also conducted for those test takers who were classified within Attention Deficit/Hyperactivity Disorder (ADHD), Learning Disability (LD), Neurological Impairment, and Visual Impairment subgroups. Of secondary interest was the validity of LSAT scores obtained by test takers who were accommodated under standard time conditions (i.e., accommodations that did not include extra testing time).

The measure used to assess the predictive validity of the LSAT for the above groups was law school first-year average (FYA). The predictive validity of undergraduate grade-point average (UGPA) was also evaluated, as was the combination of LSAT score and UGPA, commonly referred to as the Index. The sample used in this study was drawn from 590 entering law school classes from 168 individual law schools collected over five years.

The results from this study strongly suggest that:

- LSAT scores earned under accommodated testing conditions that included extra testing time are not comparable to LSAT scores earned under standard timing conditions as evidenced by a tendency of the former to overpredict FYAs (i.e., estimated FYAs based on scores from test takers accommodated with extra testing time tend to be higher than their actual FYAs); and

- results for test takers categorized within the ADHD, LD, Neurological Impairment, and Visual Impairment subgroups; and within the accommodated with extra testing time sample, were consistent with the overall group finding stated above.

These findings are consistent with those found previously by Wightman in her research report 93-03 published by LSAC. This current study also indicates that:

- LSAT scores earned under standard timing conditions are comparable, regardless of whether or not other (nontiming related) accommodations are given.

The results from this study indicate that LSAT scores obtained under accommodated conditions that included extra testing time should be evaluated with care. However, more data and further analyses will be required before more specific statements can be made, such as whether UGPA is a better predictor of FYA than LSAT scores for test takers accommodated with extra testing time.

Introduction

For each administration of the Law School Admission Test (LSAT), the Law School Admission Council (LSAC) provides accommodations for those test takers with documented disabilities who are not able to take the test under standard testing conditions. The type of accommodation granted is dependent upon the nature of each test taker's disability. Accommodations include special formats of the test, such as large-print, Braille, and audiocassette. Other modifications to the standard test administration include, but are not limited to, the use of a reader, an amanuensis, a wheelchair-accessible test center, additional rest time between sections, and additional testing time. Procedures for requesting accommodated testing conditions are provided in the *LSAT/LSDAS Registration and Information Book* (Law School Admission Council, 2001).

The goal of LSAC's policies with regard to providing accommodations is to ensure the LSAT measures the skills it is intended to measure, rather than the impact of any test taker's disability. LSAC also has an obligation to test takers and score users to evaluate, to the extent that sufficient data exist, the validity of the inferences that may be drawn from test scores earned with testing accommodations. The *Standards for Educational and Psychological Testing* state that

> When sample sizes permit, the validity of inferences made from test scores ... on tests administered to individuals with various disabilities should be investigated and reported by the agency or publisher that makes the modification (American Educational Research Association, American Psychological Association, National Council on Measurement in Education, 1999, p. 107).

The main focus of this study is the predictive validity of the LSAT for test takers who are provided with an accommodation that includes extra testing time. Early research studies have shown that even small amounts of extra testing time can significantly increase the LSAT performance of nonaccommodated test

takers, making these less-speeded scores noncomparable with scores earned under standard time constraints (see Evans & Reilly, 1971, 1972). Of secondary interest is the validity of LSAT scores obtained under accommodations that did not include extra time. Here the concern is whether these types of accommodations, such as providing a separate testing room, might introduce a noticeable extraneous influence on the validity of LSAT scores obtained under these conditions.

The predictive validity of LSAT scores (taken under standardized testing conditions), undergraduate grade-point averages (UGPAs), and the combination of these two variables is studied annually through the LSAC correlation studies service. Research summarizing these validity studies consistently indicates that LSAT scores are strong predictors of first-year law school performance, and that this prediction is improved when LSAT scores are used in combination with UGPAs (Anthony, Duffy, & Reese, 2001; Anthony, Harris, & Pashley, 1999; Wightman, 1993b). Data from these correlation studies are also used to evaluate the (differential) predictive validity of these variables for various subgroups of the test taking population in order to assure that their use in the admissions process is equitable for applicants who are members of these subgroups (Anthony & Liu, 2001; Anthony, Reese, & Pashley, 2001; Dalessandro & McLeod, 1999; Duffy & Roussos, 2001; Harris, Roussos, & Pashley, 2001; Wightman, 1990; Wightman & Muller, 1990).

Predictive validity for accommodated test takers has been studied by a number of other large-scale testing programs. Braun, Ragosta, and Kaplan (1986a) observed some overprediction of college performance for accommodated SAT takers, especially for those with learning disabilities. In a follow-up to the Braun et al. study, Ragosta, Braun, and Kaplan (1991) observed a slight overprediction of overall UGPA for learning disabled test takers regardless of whether or not they tested with accommodations. Braun, Ragosta, & Kaplan (1986b) also reported some overprediction of graduate school performance for Graduate Record Exam (GRE) accommodated test takers.

This current study was undertaken with the goal of evaluating the predictive validity of LSAT scores, UGPAs, and the combination of these two variables for predicting law school first-year averages (FYAs) of those who have taken the LSAT under accommodated testing conditions. In a previous study, Wightman (1993a) concluded that the law school performance of accommodated test takers, in terms of FYA, tends to be overpredicted when each of these prediction equations is applied (i.e., estimates of FYAs were found to be higher on average than actual FYAs for the accommodated sample used in the study). However, her conclusions were based on fairly small sample sizes that were available at the time and reflected performance on the pre-June 1991 LSAT 10-48 score scale. This present study is based on more data and addresses the predictive validity of the current version of the LSAT for accommodated test takers.

Sample Definition

Since the focus of this research was on the evaluation of predictive validity, the analyses carried out required that data on the two predictor variables, LSAT score and UGPA, and the criterion variable, FYA, be available for each test taker included in this study. Therefore, only test takers who were admitted to law school and obtained an FYA were eligible for inclusion in the analysis sample. Note that no information is available concerning possible accommodations test takers in this sample may have received at their undergraduate institution or are receiving (or may have received) at their law school.

Since data from the annual LSAC correlation studies were used here, this study was also limited to those law schools that chose to participate in the correlation studies and provided LSAC with their students' FYAs. In this study certain analyses were performed within individual law schools, one academic year at a time, and the results pooled. Data from two law schools were removed from the sample because their very small class sizes did not support this type of analysis. This resulted in the removal of three accommodated LSAT students from the sample.

Each law school student in the sample was categorized in terms of their type of LSAT administration. Specifically, students were classified first as having taken the LSAT under accommodated or nonaccommodated (i.e., standard) conditions. Within the group of those taking an accommodated LSAT administration, students were further categorized as testing with extra time (i.e., nonstandard time) or standard time conditions. The following two-by-two table describes these classifications and includes the number of students in the sample for each type of administration.

	Accommodated	Nonaccommodated
Extra Time	Accommodated/Extra Time (n = 1,249)	———
Standard Time	Accommodated/Standard Time (n = 209)	Nonaccommodated (n = 121,607)

Within the Accommodated/Extra Time and Accommodated/Standard Time samples, students were further categorized with regard to their type of disability. The typical disability categories for accommodated LSAT takers are described in Table 1.

TABLE 1
Description of disability classifications

Classification	Description
Attention Deficit/ Hyperactivity Disorder (ADHD)	refers to a collection of symptoms that include inattention, difficulty in delaying gratification, overactivity or motor restlessness, distractibility, impulsivity, and short attention span
Hearing Impairment	any debilitating loss or distortion of hearing
Learning Disability (LD)	a varied group of disorders characterized by considerable difficulties in the acquisition and use of listening, speaking, reading, writing, reasoning, or mathematical abilities
Neurological Impairment (NI)	impairment of the neurological system, including but not limited to paraplegia or quadriplegia, traumatic brain injury, stroke syndromes, cerebral palsy, multiple sclerosis, muscular dystrophy, or nerve injury
Physical Disability	includes a wide variety of medical/surgical conditions that affect multiple body organs and systems
Psychological Disability	any diagnosed psychological condition, including depression, bipolar disorder, panic disorder, obsessive-compulsive disorder, generalized anxiety disorder, social phobia, specific phobias, posttraumatic stress disorder
Visual Impairment (VI)	any debilitating loss or distortion of vision
Other	usually refers to medical conditions that are not encompassed within other categories of impairment, such as diabetes

Note: Background information for the descriptions came from Spree, Risser, & Edgell, 1995; Wainpel, 1998

The collection of matriculants to a law school for an academic year is commonly referred to as that law school's entering class. In forming the analysis sample, data were included from five years of entering classes: 1995 through 1999. Note that an entering class was included in the analysis sample only if that class included at least one student who took the LSAT under accommodated testing conditions (with either extra time or no extra time). Table 2 summarizes the number of classes included in the Accommodated/Extra Time and Accommodated/Standard Time samples for each entering class year. For the combined accommodated sample (which is not presented in Table 2), there were a total of 590 entering classes that contained at least one Accommodated/Extra Time or Accommodated/Standard Time sample student. Therefore, data from 590 entering classes were used in the analyses presented here.

TABLE 2
Number of entering classes containing accommodated sample students by year

	Number of Entering Classes	
Year	Accommodated/ Extra Time	Accommodated/ Standard Time
1995	110	30
1996	119	31
1997	118	43
1998	103	49
1999	98	21
Total	548	174

Table 3 provides the number of entering classes that contain a given number of accommodated sample students. So, for example, there were 225 and 145 entering classes that contained one Accommodated/Extra Time and one Accommodated/Standard Time sample student, respectively. This table reveals that there are only a small number of accommodated LSAT takers in the vast majority of entering classes.

TABLE 3
Number of accommodated sample students per entering class

	Number of Entering Classes	
Number of Accommodated Sample Students per Class	Accommodated/ Extra Time	Accommodated/ Standard Time
1	225	145
2	160	23
3	77	6
4	33	
5	24	
6	10	
7	4	
8	9	
9	1	
10	3	
11	2	

The number of law schools contributing data from between one and five entering classes to the sample is provided in Table 4. Note that there are 168 distinct law schools represented in the overall sample. Figure 1 displays the sizes, in terms of all students, of the 590 entering classes included in the study.

TABLE 4
Number of entering classes from individual law schools containing accommodated sample students

	Number of Law Schools	
Number of Entering Classes	Accommodated/ Extra Time	Accommodated/ Standard Time
1	25	53
2	24	44
3	39	11
4	42	0
5	38	0
Total	168	108

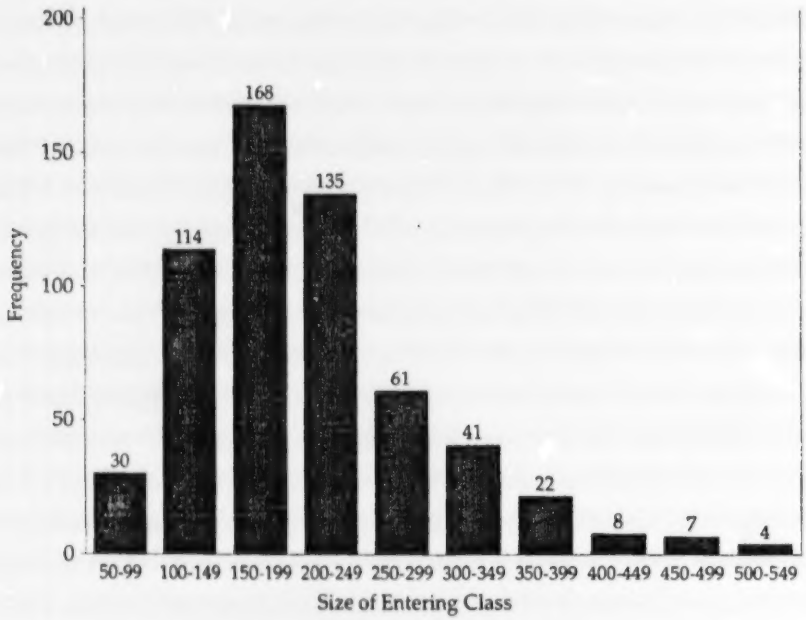

FIGURE 1. *The distribution of entering class sizes*

Table 5 provides sample size information by type of administration and type of disability, for each of the five years. Given these sample sizes, subgroup analyses were only performed for the ADHD, LD, Neurological, or Visual subgroups within the Accommodated/Extra Time sample.

TABLE 5
Sample counts by year

Group	1995	1996	1997	1998	1999	Total
Total	25,922	26,126	25,281	23,542	22,194	123,065
Accommodated/Extra Time	244	306	304	213	182	1,249
ADHD	20	41	45	32	34	172
Hearing Impairment	1	0	1	2	2	6
Learning Disability	154	182	195	146	110	787
Neurological Impairment	21	30	23	14	11	99
Physical Disability	9	5	3	2	3	22
Psychological Disability	6	5	5	0	3	19
Visual Impairment	31	39	31	16	18	135
Other	2	4	1	1	1	9
Accommodated/Standard Time	37	36	50	62	24	209
ADHD	2	5	7	8	3	25
Hearing Impairment	2	3	2	3	2	12
Learning Disability	0	2	4	1	1	8
Neurological Impairment	3	3	7	10	5	28
Physical Disability	10	13	10	14	2	49
Psychological Disability	1	1	1	4	0	7
Visual Impairment	4	1	11	11	7	34
Other	15	8	8	11	4	46
Nonaccommodated	25,641	25,784	24,927	23,267	21,988	121,607

Finally, Table 6 contains gender and ethnic counts and percentages for certain subgroups. Some analyses in this study were performed using a Matched Sample comprised of equally sized subsets of the Accommodated/Extra Time and Nonaccommodated samples, matched by LSAT, UGPA, gender, ethnicity, and entering class. The counts and percentages listed under the Matched Sample heading refer to each subset within the Matched Sample (i.e., the Accommodated/Extra Time and Nonaccommodated subsets within the Matched Sample have identical gender and ethnic distributions).

TABLE 6
Gender and ethnic counts and percentages

	Total		Accommodated/ Extra Time		Matched Sample		Accommodated/ Standard Time	
	Count	%	Count	%	Count	%	Count	%
Gender								
Female	56,082	45.57	406	32.51	241	31.26	96	45.93
Male	66,651	54.16	823	65.89	530	68.74	109	52.15
No response	332	0.27	20	1.60	0	0	4	1.91
Ethnicity								
American Indian	984	0.80	10	0.80	0	0	3	1.44
African American	8,938	7.26	59	4.72	16	2.08	6	2.87
Caucasian	90,919	73.88	975	78.06	743	96.37	169	80.86
Chicano/Mex. Amer.	2,457	2.00	20	1.60	1	0.13	3	1.44
Hispanic	4,285	3.48	40	3.20	4	0.52	6	2.87
Asian/Pacific Islander	8,410	6.83	30	2.40	6	0.78	7	3.35
Puerto Rican	963	0.78	9	0.72	1	0.13	1	0.48
Other	3,717	3.02	72	5.76	0	0	10	4.78
Canadian Aboriginal	23	0.02	0	0	0	0	0	0
No response	2,369	1.92	34	2.72	0	0	4	1.91
Total	123,065		1,249		771		209	

Predictor and Criterion Variables

As indicated above, the variables analyzed in this study are those that are currently used in the LSAC Correlation Studies: LSAT score, undergraduate grade-point average (UGPA), and law school first-year average (FYA). LSAT scores and UGPAs were used as predictors, either separately or in combination, of the criterion FYA. These variables, and others derived from them, are further described in this section.

LSAT Scores. All students whose data were used in this study were tested with the most recent version of the LSAT. The standard version of the current test includes four scored 35-minute sections. (Test takers accommodated with extra time were allowed more time, typically ranging from time-and-a-half to double time.) These sections contain items designed to measure analytical (or deductive) reasoning, verbal (or informal logical) reasoning, and reading comprehension. The specific item type makeup for the scored sections is as follows:

Item Type	Number of Items
Reading Comprehension	26 to 28
Logical Reasoning (A)	24 to 26
Logical Reasoning (B)	24 to 26
Analytical Reasoning	22 to 24

The total number of scored items on the most recent version of the LSAT typically ranges from 100 to 102. A single score derived from the sum of the total number of questions answered correctly across the four scored sections is then equated and reported on an LSAT scale that ranges from 120 to 180.

Only LSAT scores reported on the 120 to 180 score scale were used in this study. For students who have multiple LSAT scores, a single arithmetic average (i.e., mean) of the multiple scores was used. If any student took the test more than three times, only the most recent three scores were averaged. Note that LSAT scores obtained at each administration are equated (i.e., small differences between test forms in terms of difficulty

are adjusted for) to provide a constant score scale. That is, LSAT scores on the 120-180 scale have the same meaning regardless of the year or administration during which they were obtained.

Undergraduate grade-point average. A UGPA is the average grade earned by a student during his or her undergraduate study as computed by the Law School Data Assembly Service (LSDAS), or according to LSDAS procedures. Grades computed in this manner are expressed on a scale of 0.00 to 4.33. The UGPAs used in this study are the same as those used in the LSAC Correlation Studies carried out annually for individual law schools. Note that no effort is made to standardize UGPAs beyond placing them on a common 0 to 4.33 scale. In other words, UGPAs are not adjusted to reflect course difficulty, number of courses taken, length of study, potential grade inflation, etc.

First-year average. This variable is the average grade earned by a student in the first year of law school. FYA is provided for each student by individual law schools as part of their participation in the LSAC Correlation Studies service. As different law schools use different scales for first-year grades, FYAs were standardized within each entering class to have a mean of 50 and a standard deviation of 10 for purposes of analyses in this study.

Index. The Index is an estimated FYA that is derived (by applying linear regression) to predict FYA from the combination of LSAT score and UGPA. Separate index equations to estimate FYA were developed within each law school entering class. While each entering class index mean will be 50, as it is for FYA, each entering class index was not rescaled to have a standard deviation of 10 (i.e., the lower index standard deviations reflect the reliability levels of the predictors and were not restandardized).

Z-scores. Standardized scores or Z-scores, formed by setting the entering class mean to 0 and standard deviation to 1, were derived for all four variables listed above. These transformations provide a rudimentary method for comparing the relative magnitudes of variables to each other and across entering classes.

Descriptive Statistics

Statistical characteristics of the various samples used in this study are presented in Table 7. The results for the Total group are presented first to provide a reference for evaluating the results for the other study groups. Since they comprise the vast majority of the overall sample, the results for the Nonaccommodated group are very similar to those of the Total group. Note that the standardized score correlations of LSAT score, UGPA, and Index with FYA for the Total and Nonaccommodated groups are consistent with those typically observed in the LSAC Correlation Studies. The correlations reported for the accommodated groups are all lower (with the exception of UGPA for the Accommodated/Standard Time group), but are still fairly strong. These lower correlation results should not be overinterpreted, since the magnitude of this statistic is affected by the restriction of range associated with subgroup selection. Also note that one variable may substantially over- or underpredict another variable even though the two variables are strongly correlated.

TABLE 7
Statistical characteristics of analysis samples

				Scores Standardized within Class		
Group and Sample Size	Variable	Mean	SD	Mean	SD	Correlation with FYA
Total	LSAT	156.23	7.41	0	1	0.40
n = 123,065	UGPA	3.23	0.42	0	1	0.25
	INDEX	50.00	4.91	0	1	0.48
	FYA	50.00	9.98	0	1	-
Accommodated/	LSAT	157.57	8.07	0.22	1.12	0.34
Extra Time	UGPA	3.1	0.44	-0.33	0.99	0.16
n = 1,249	INDEX	49.93	5.24	0	1.08	0.41
	FYA	45.09	10.24	-0.49	1.02	-
ADHD	LSAT	157.83	8.49	0.34	1.08	0.34
n = 172	UGPA	2.98	0.47	-0.59	1.01	0.11
	INDEX	49.58	5.07	-0.06	1.04	0.39
	FYA	44.85	10.37	-0.51	1.04	-
Learning Disability	LSAT	157.56	7.99	0.25	1.10	0.34
n = 787	UGPA	3.08	0.43	-0.36	0.97	0.19
	INDEX	49.97	5.15	0.01	1.07	0.42
	FYA	45.28	10.02	-0.47	1.00	-
Neurolocial Impairment	LSAT	156.18	7.69	0.04	1.28	0.43
n = 99	UGPA	3.22	0.41	-0.04	0.96	0.09
	INDEX	50.05	5.71	0.04	1.17	0.47
	FYA	44.25	11.71	-0.57	1.17	-
Visual Impairment	LSAT	157.54	8.24	0.06	1.23	0.25
n = 135	UGPA	3.21	0.45	-0.13	1.08	0.16
	INDEX	49.77	5.68	-0.04	1.15	0.35
	FYA	44.81	10.95	-0.52	1.10	-
Accommodated/	LSAT	153.52	8.18	-0.26	1.16	0.31
Standard Time	UGPA	3.16	0.45	-0.07	1.04	0.28
n = 209	INDEX	48.71	5.73	-0.26	1.16	0.42
	FYA	46.46	10.50	-0.35	1.05	-
Nonaccommodated	LSAT	156.22	7.40	0	1	0.40
n = 121,607	UGPA	3.23	0.42	0	1	0.25
	INDEX	50.00	4.91	0	1	0.49
	FYA	50.06	9.96	0	1	-

Note. SD denotes standard deviation

Results for the overall Accommodated/Extra Time sample, and the ADHD, Learning Disability, Neurolocial Impairment, and Visual Impairment subgroups within this group, indicate a tendency toward relatively high LSAT scores and relatively low UGPAs, on average, as compared to the Total group. The index, which combines these two variables, falls somewhere between them, as would be expected. Conversely, FYAs for this group tend to be relatively low, indicating a discrepancy between entering law school credentials and first-year law school performance.

The summary statistics presented for the standardized scores for these groups should provide an even clearer picture of the discrepancy between entering credentials and subsequent performance. Here, the mean LSAT standardized score for the Accommodated/Extra Time sample is .22, or almost a quarter of a standard deviation above the Total group mean of zero, with the mean standardized score for the index falling at zero.

Conversely, the mean FYA standardized score is -.49, or almost a half standard deviation below the mean for the Total group. The discrepancy between FYA and the mean UGPA standardized score of -.33 is not as severe. Again, the results presented for the four individual disability groups are similar, and in some cases, more extreme.

The Accommodated/Standard Time group does not display the same discrepancy between entering credentials and law school performance, with relatively similar standardized score means for LSAT score, index, and FYA.

Residual Analyses

A simple residual analysis is often conducted during the course of assessing the predictive validity of predictor variables. Here a statistical model is specified that relates the predictor variable (or predictor variables) to a suitable criterion variable. The parameters of the model are estimated using a sample of persons for whom both predictor and criterion variable values are available. Then the estimated prediction model is used to produce estimates of the criterion variable, again for a sample of persons for whom both predictor and criterion variable values are available (and is often the sample that was used to calibrate the prediction model). The accuracy of the prediction model is assessed by studying the differences between estimated criterion values and the actual criterion values. Of course, a multitude of variations on this simple approach have been proposed and used to deal with more complex predictive validity studies.

In this study the adequacies of LSAT scores obtained under standard conditions, UGPAs, and the combination of the two for predicting FYAs is not being questioned. The predictive validity of these predictor variables has long been established and is monitored on an ongoing basis. The simple linear regression model has also been deemed sufficient to relate the predictor variables to FYA. The question here is whether LSAT scores obtained under nonstandard conditions are comparable to those obtained under standard conditions in terms of predictive validity. This question was first addressed in this study by proceeding with the simple residual analysis outlined above, but then paying special attention to the predictive performance of the LSAT scores that were obtained under nonstandard conditions.

The three prediction models based on LSAT, UGPA, and a combination of the two used in this study were developed in two different ways. In the first approach, regression models were developed for each individual entering class. This entailed performing three separate regression analyses within each of the 590 entering classes contained in the sample. (Actually, only two additional prediction models based on LSAT and UGPA per entering class were needed as the index itself was initially developed as a within-entering-class prediction model FYA estimate based on both LSAT and UGPA.) Residuals, calculated as estimated FYA minus actual FYA, were then calculated within entering classes and accumulated across entering classes. The results of this approach are given in Table 8 under the heading Within Class Regressions.

In the second approach, three prediction models were derived based on the entire pool of standardized LSAT, UGPA, and index scores (i.e., the Z-scores derived within entering classes for these three variables). Residuals were then calculated in the same manner as with the first approach. The results from this methodology are given in Table 8 under the heading Pooled Class Regressions.

Note that all students, accommodated and nonaccommodated, were used in the development of these regression models. This inclusion methodology normally provides somewhat more conservative results (e.g., smaller deviations from the prediction model for the accommodated sample would be expected) than the alternative exclusion methodology in which the regression models are derived based only on the nonaccommodated sample and then applied to the various accommodated samples. However, given the sparseness of the accommodated sample, both these methodologies (i.e., inclusion and exclusion) should yield similar results. In other words, the influence of the accommodated sample on the regression models should be very minor relative to the influence of the much larger nonaccommodated sample.

The results obtained from these two model building approaches (i.e., within class regressions versus pooled class regressions) are extremely close, as is evident in Table 8. This outcome suggests that other analyses based on pooled values across entering classes may be reasonable to conduct.

Table 8 presents results for the total sample first. The mean residuals for the total is zero due to the fact the regression models were derived using the entire sample. The nonaccommodated sample results, shown in the last rows of Table 8 are very similar to the total's. The small departures in mean residuals indicated the small amount of influence the accommodated sample has on the regression equations.

Results for the Accommodated/Extra Time sample and related subgroups are very similar to one another. All three variables, LSAT, UGPA, and index, consistently overpredict FYA by a significant amount. LSAT scores in particular consistently overpredict FYA by more than half a standard deviation.

Results for the Accommodated/Standard Time group indicate that their LSAT scores and indexes overpredict FYAs by less than half as much as for the Accommodated/Extra Time group. Interestingly, for this group UGPA provides the largest overprediction results.

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TABLE 8
Residual analyses for FYA estimation models using LSAT, UGPA, or index as predictor

Group and Sample Size	Predictor Variable	Within Class Regressions		Pooled Class Regressions	
		Mean Residual	Standard Error	Mean Residual	Standard Error
Total	LSAT	0	0.03	0	0.03
n = 123,065	UGPA	0	0.03	0	0.03
	INDEX	0	0.02	0	0.02
Accommodated/	LSAT	5.72	0.27	5.80	0.27
Extra Time	UGPA	4.07	0.29	4.08	0.29
n = 1,249	INDEX	4.84	0.27	4.91	0.27
ADHD	LSAT	6.39	0.75	6.48	0.75
n = 172	UGPA	3.56	0.79	3.67	0.79
	INDEX	4.73	0.74	4.87	0.73
Learning Disability	LSAT	5.61	0.34	5.70	0.34
n = 787	UGPA	3.83	0.35	3.82	0.35
	INDEX	4.69	0.33	4.75	0.33
Neurological Impairment	LSAT	5.88	1.04	5.89	1.06
n = 99	UGPA	5.63	1.16	5.66	1.18
	INDEX	5.79	1.03	5.92	1.04
Visual Impairment	LSAT	5.31	0.95	5.43	0.93
n = 135	UGPA	4.87	0.92	4.86	0.93
	INDEX	4.96	0.91	5.02	0.90
Accommodated/	LSAT	2.40	0.69	2.51	0.70
Standard Time	UGPA	3.37	0.69	3.35	0.70
n = 209	INDEX	2.24	0.66	2.29	0.67
Nonaccommodated	LSAT	-0.06	0.03	-0.06	0.03
n = 121,607	UGPA	-0.05	0.03	-0.05	0.03
	INDEX	-0.05	0.02	-0.05	0.02

Figures 2 through 7 present individual residuals (i.e., estimated FYAs minus actual FYAs) plotted against their respective predictor variables. Results from the pooled class regressions were used in these figures, so the predictor variables are the within-class standardized LSAT, UGPA, or index.

For the Accommodated/Extra Time sample and associated subgroups, the dispersion of residuals associated with using LSAT as a predictor (seen in the first panels of Figures 2 through 6) are clearly seen to be centered above the zero reference line, indicating substantial overprediction of FYA. The same, but to a somewhat lesser degree, is also evident for the index. The same cannot be said for the UGPA residuals which appear to be more centered around zero than those associated with LSAT and index.

The residual plots for the Accommodated/Standard Time sample, provided in Figure 7, appear to be more closely centered around the zero reference line, as would be expected given their lower mean residuals.

Besides providing a feel for the amount of overprediction present, these figures also illustrate where overprediction may occur. In particular, for the Accommodated/Extra Time sample and associated subsamples, overprediction yielded by both the LSAT and Index prediction models appears to occur throughout the range of these variables.

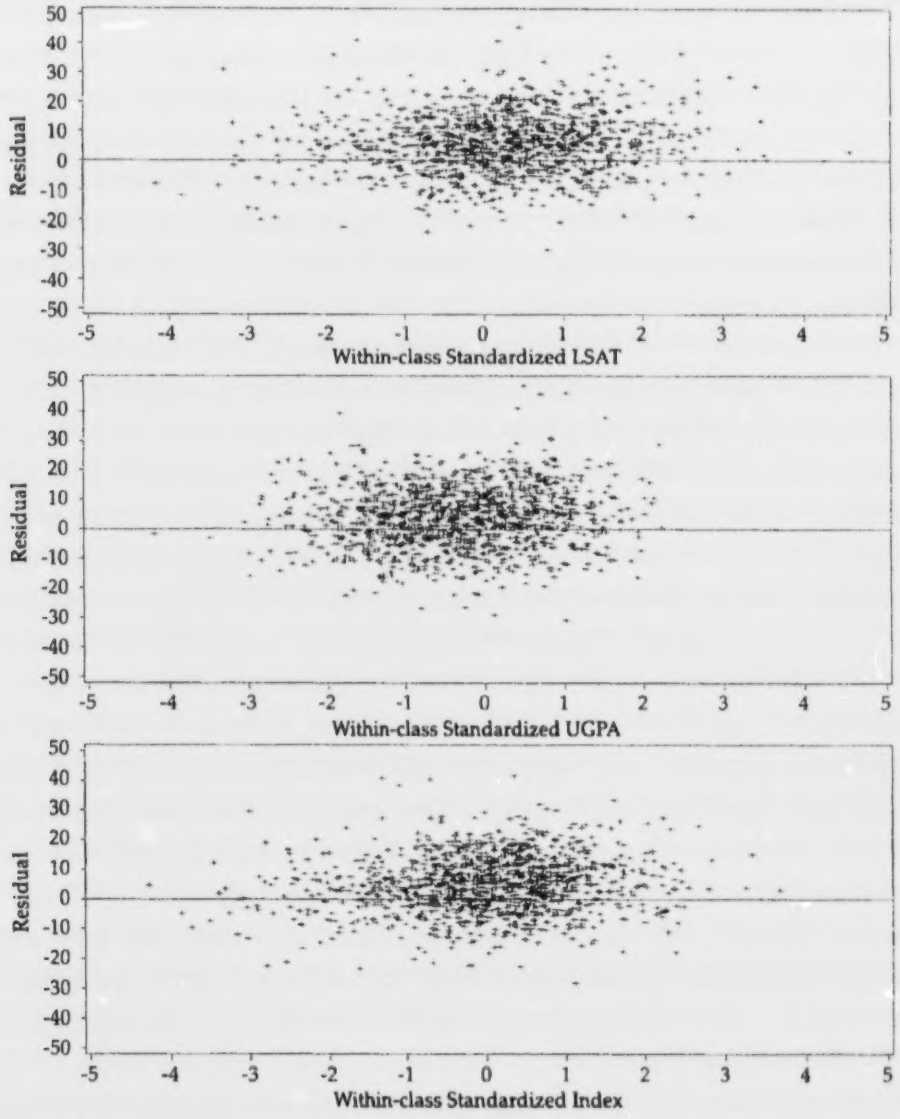

FIGURE 2. *Residuals (estimated FYA minus actual FYA) for the accommodated/extra time sample (n = 1,249) from three pooled-class regression models using within-class standardized LSAT, UGPA, and index as predictors*

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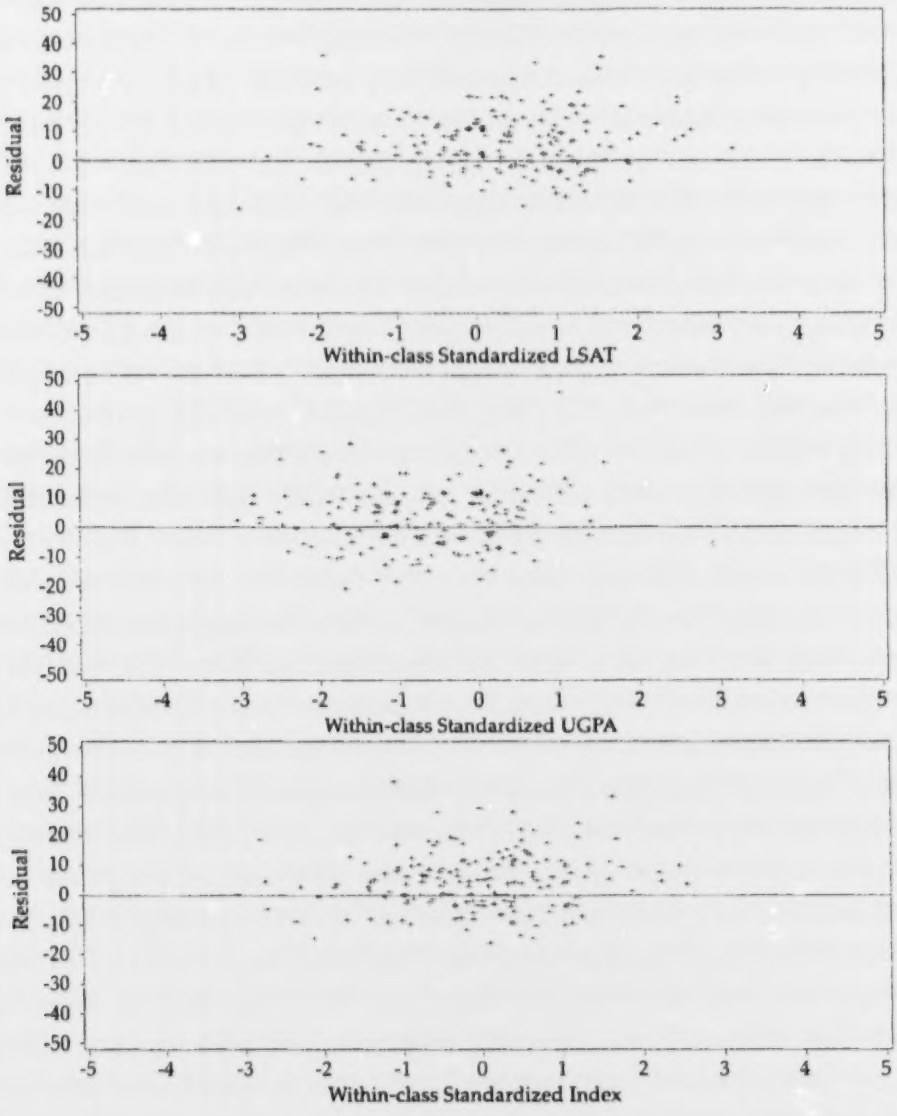

FIGURE 3. *Residuals (estimated FYA minus actual FYA) for the attention deficit/ hyperactivity disorder subgroup (n = 172) within the accommodated/extra time sample from three pooled-class regression models using within-class standardized LSAT, UGPA, and index as predictors*

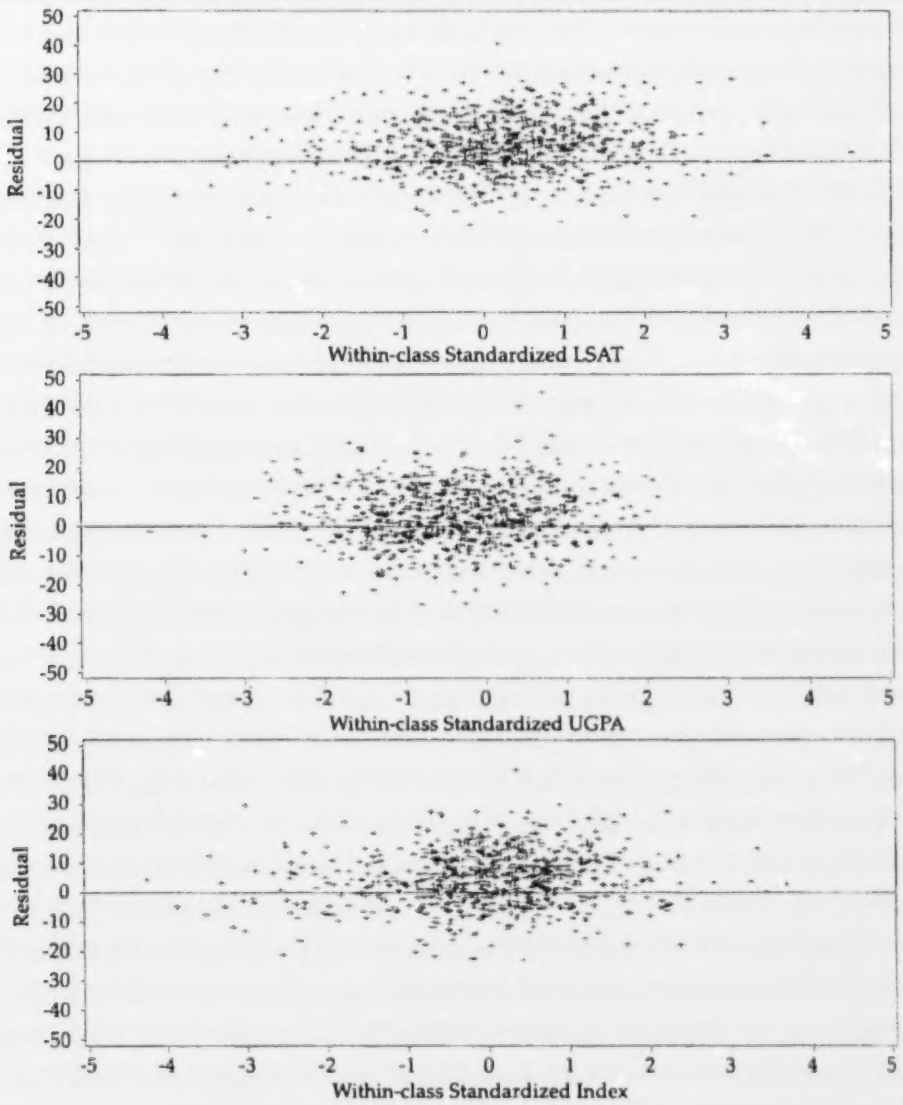

FIGURE 4. *Residuals (estimated FYA minus actual FYA) for the learning disability subgroup (n = 787) within the accommodated/extra time sample from three pooled-class regression models using within-class standardized LSAT, UGPA, and index as predictors*

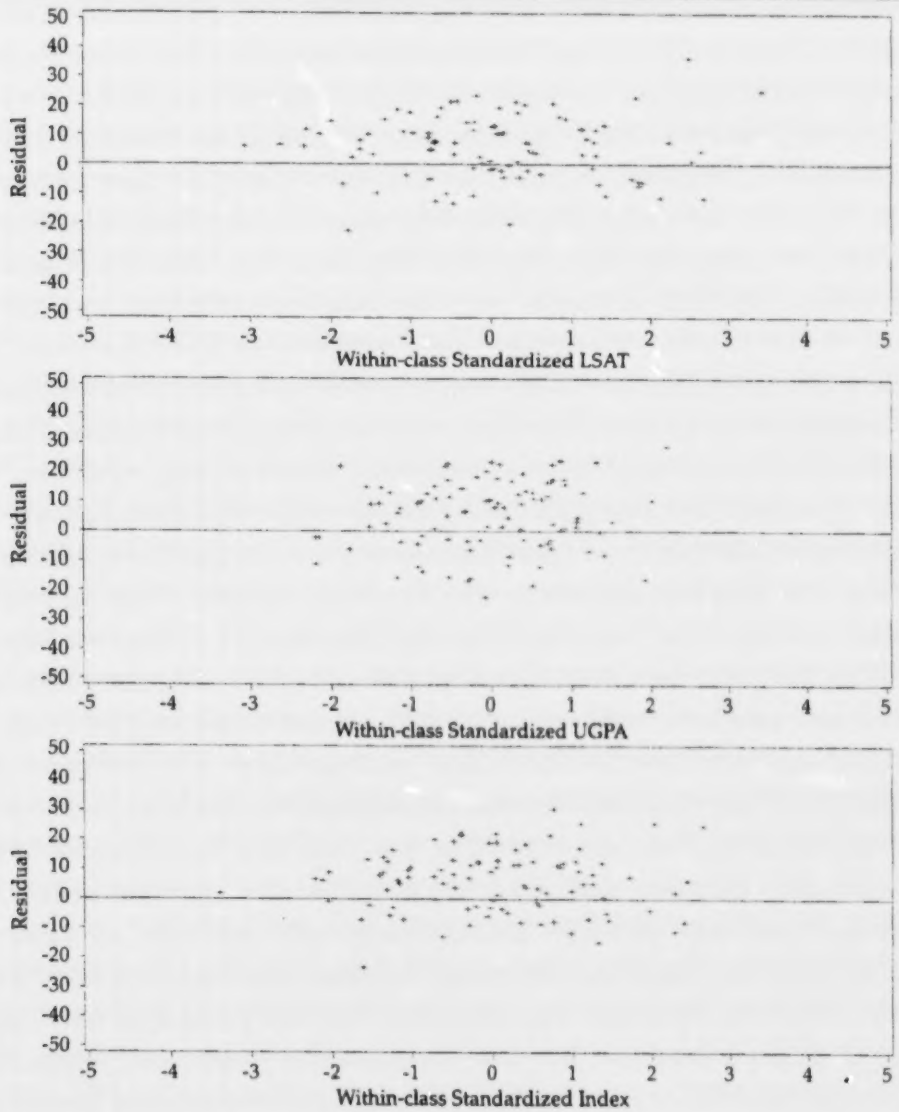

FIGURE 5. *Residuals (estimated FYA minus actual FYA) for the neurological impairment subgroup (n = 99) within the accommodated/extra time sample from three pooled-class regression models using within-class standardized LSAT, UGPA, and index as predictors*

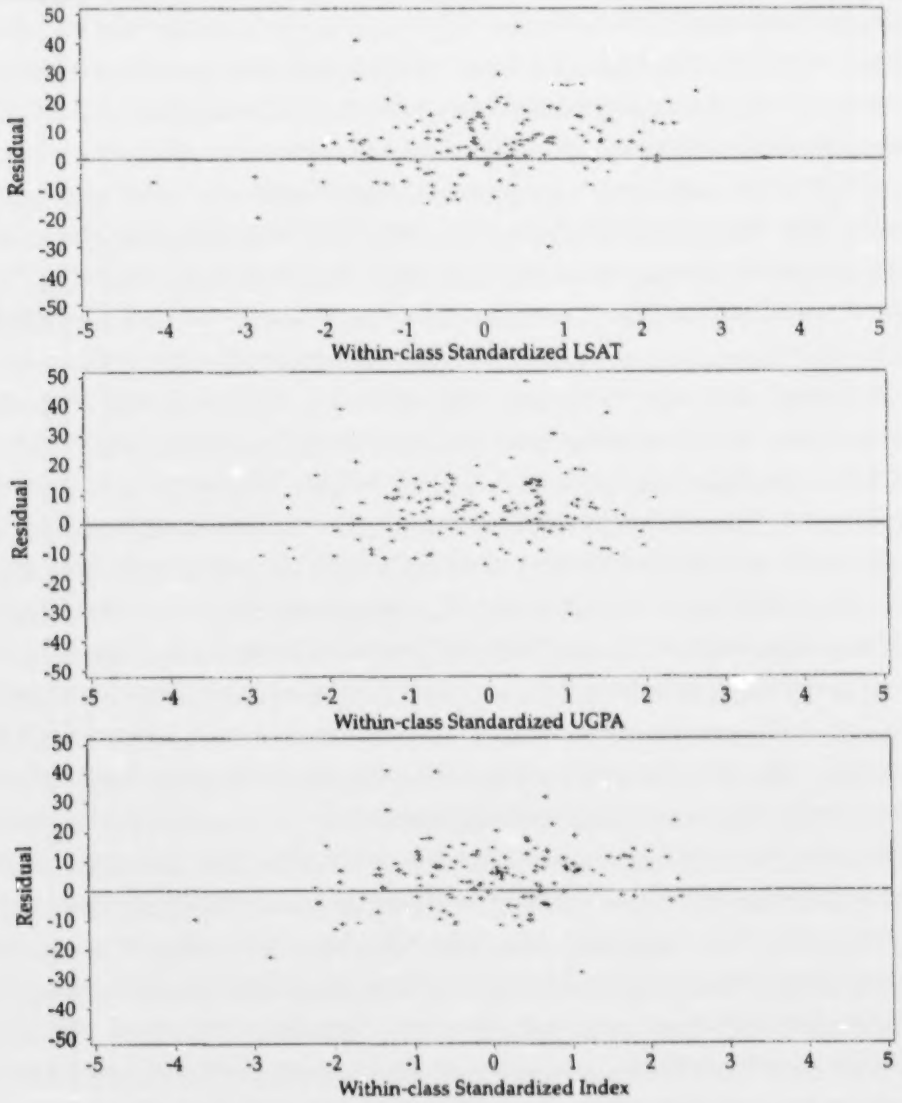

FIGURE 6. *Residuals (estimated FYA minus actual FYA) for the visual impairment subgroup (n = 135) within the accommodated/extra time sample from three pooled-class regression models using within-class standardized LSAT, UGPA, and index as predictors*

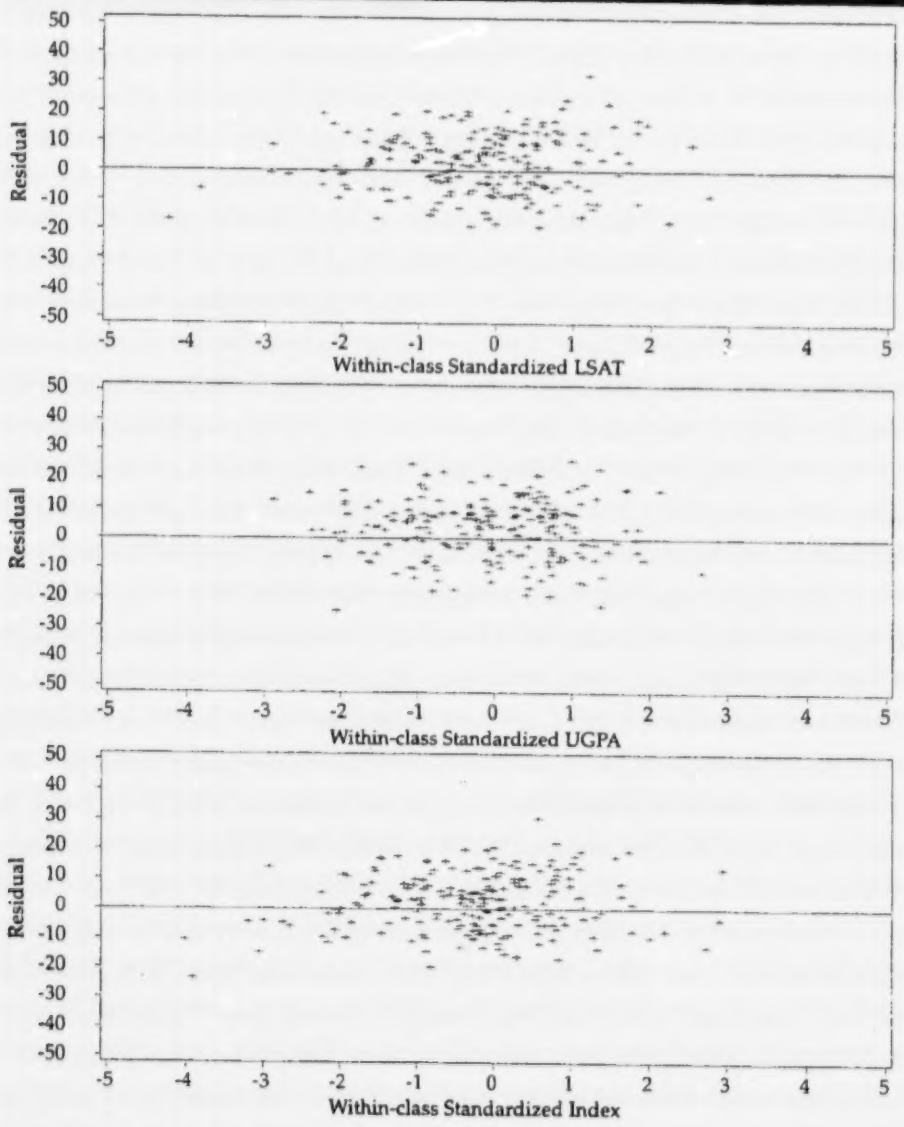

FIGURE 7. *Residuals (estimated FYA minus actual FYA) for the accommodated/standard time sample (n = 209) from three pooled-class regression models using within-class standardized LSAT, UGPA, and index as predictors*

Decile Analyses

While residual regression analyses may provide useful "statistical" information concerning the validity of law school performance predictors, the practical implications of these analyses may not be obvious to all. As an alternative predictive validity assessment approach, law school deans, professors, or admission professionals could simply track the relative standing of matriculants with regard to an admission variable, such as the LSAT, compared to the relative standing of those same students with regard to their first-year grades. If the rank or standing of students determined according to their entering credentials (i.e., ranked against others in their entering class) is close to the rank of the same students based on FYA, those entering credentials could be deemed valid for prediction purposes. On the other hand, if a substantial number of matriculants arrive on the first day with high credentials (relative to others in their entering class), but finish the first year in the bottom on their class with regard to FYA, some doubt would be cast upon the validity of those credentials for the purposes of predicting FYA.

With this simple idea in mind, a decile analysis was developed to investigate the practical implications of invalid measures, and the phenomenon of overprediction in particular. For any group, deciles can be formed by first ordering the group members according to some variable, such as LSAT score, and then dividing the group into 10 equally populated subgroups. If LSAT scores were used to rank 100 group members, the first or lowest decile would contain the 10 members of the group who had the lowest LSAT scores. The tenth decile would likewise contain the ten highest LSAT-ranked group members. Of course, if the group size is not divisible by 10 or there are many ties among the ranking variable values, only approximately equal decile groups can be formed. (Note: the term decile is used here as shorthand for one of the 10 subgroups, but is technically one of nine cutoff values that divide the total group into 10 equal parts.)

In this study LSAT scores, UGPAs, index scores, and FYAs were used separately to rank students in relation to all others in their entering classes and to place them into four separate series of deciles. These entering class specific decile standings were then pooled separately across all entering classes. Various subsamples were then examined to see whether their relative standing on one variable differed systematically from their standing according to a different variable.

Figure 8 provides two examples of how this decile analysis proceeds. The left-hand side of the figure presents decile results for the entire nonaccommodated sample. Given that they constitute almost 99% of the total sample, their results reflect the total sample results very closely. The first solid bar chart shows the decile distribution of LSAT scores for this group. Here only small departures from the expected 10% groupings is observed. The same is true for FYA deciles shown in the second bar chart. Note that for the first two bar charts, the heights of their respective bars will always sum to 100%.

The third solid bar chart relates the discrepancies in decile standings by student. So, for example, about 17% of the students in the nonaccommodated sample fell in the same decile ranking (indicated on the horizontal axis by zero) with regard to their LSAT scores as they did with regard to their FYAs. Because the LSAT is not a perfect predictor of FYA, some error or spread away from zero is expected. Positive discrepancies (i.e., positive values on the horizontal axis) reflect movement from LSAT deciles to lower FYA deciles. Negative discrepancies reflect the opposite.

The final solid bar chart in the series gives percentage differences between the subsample results shown in the third bar chart and the total sample distribution of decile differences. In this way, the total sample provides a baseline to judge whether the differences observed in deciles should be of concern or not. Valid predictors will yield only small departures from the horizontal reference line.

The sample of students whose results are presented on the right-hand side of Figure 8 was formed by randomly selecting 590 students from the nonaccommodated sample, one from each entering class. The first two bar charts indicate that this group is fairly evenly spread across both the LSAT and FYA decile ranges. The decile differences bar chart appears similar to the total sample distribution and the fourth bar chart confirms this impression.

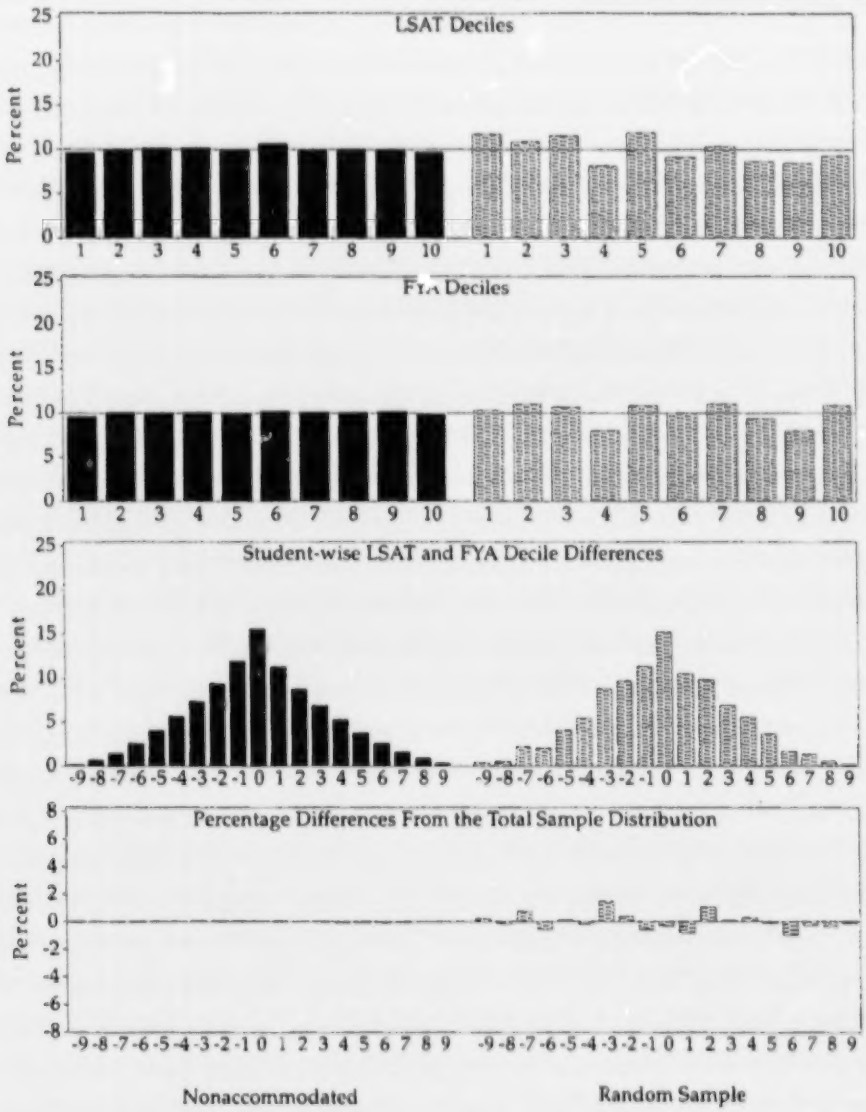

FIGURE 8. *LSAT versus FYA decile results for the nonaccommodated sample (n = 121,607) and a sample (n = 590) of randomly drawn students, one per class, from the nonaccommodated sample. (Note that "differences" are calculated as LSAT decile minus FYA decile by student.)*

The bar charts in Figure 9 relate a much different story for the Accommodated/Extra Time sample. As statistics presented earlier suggested, this group possesses higher than average LSAT credentials. Over 20% of this group ranked in the top 10% of their entering classes with regard to their LSAT scores. However, in terms of FYA standing, over 20% ended up in the bottom 10% of their class.

Differences in LSAT and FYA decile rankings by student are also striking. The third bar chart shows a clear skew to the right, indicating a drop off in standing when these students LSAT ranking is compared to their FYA ranking. The fourth bar chart in the series confirms the magnitude of these discrepancies.

In Figures 9 through 14, decile results for a matched sample of nonaccommodated sample students are given on the right-hand side for comparison purposes. In each case, the distribution of deciles on the left-hand side of the first panel were replicated by randomly selecting for each student represented on the left-hand side a nonaccommodated sample student from the same entering class and same decile within that class. So in Figure 9, while the LSAT deciles distributions for the two groups match perfectly, the

nonaccommodated sample students went on to perform better in law school in terms of FYA. The third and fourth panels indicate that their LSAT scores predicted their FYAs in a valid manner.

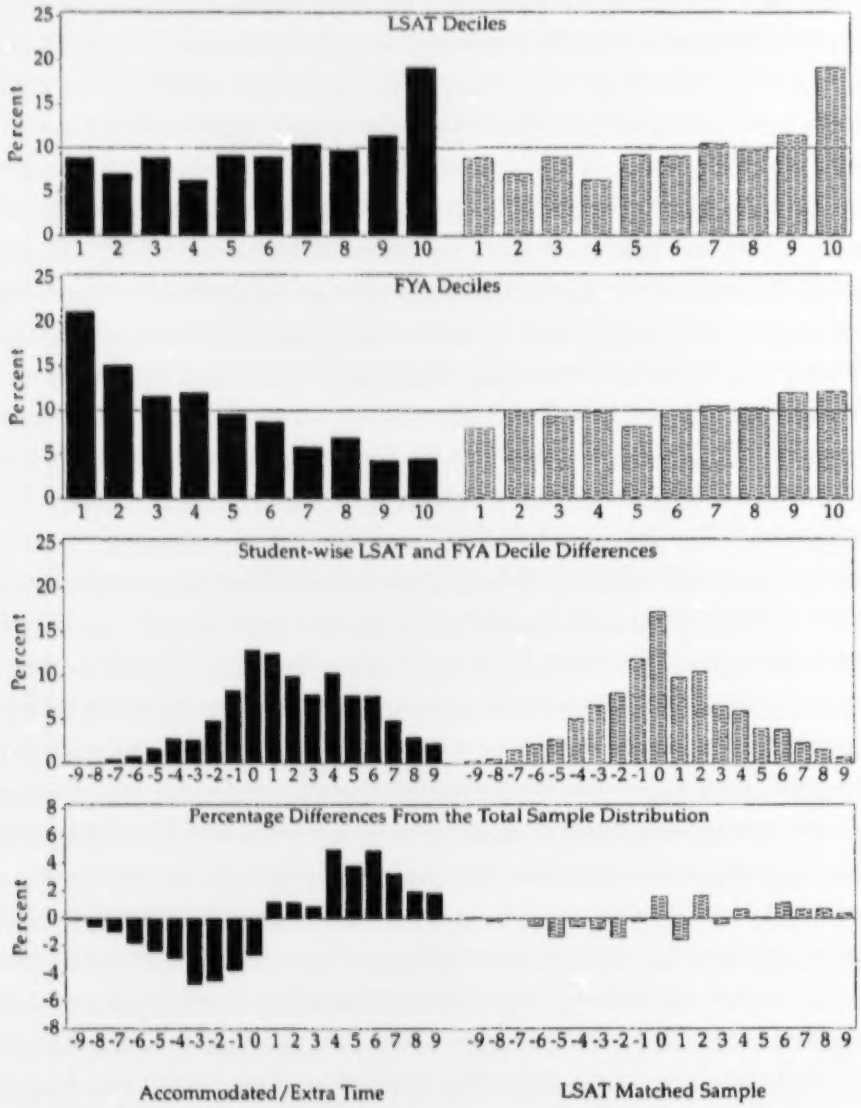

FIGURE 9. *LSAT versus FYA decile results for the accommodated/extra time sample (n = 1,249) and an LSAT decile matched sample (n = 1,249) of randomly drawn nonaccommodated sample students from the same classes. (Note that "differences" are calculated as LSAT decile minus FYA decile by student.)*

In Figure 10, the decile distributions of UGPA and FYA for the Accommodated/Extra Time sample students are more synchronized, and differences in deciles are quite reasonable and comparable to the differences found for the randomly matched sample whose results are given on the right.

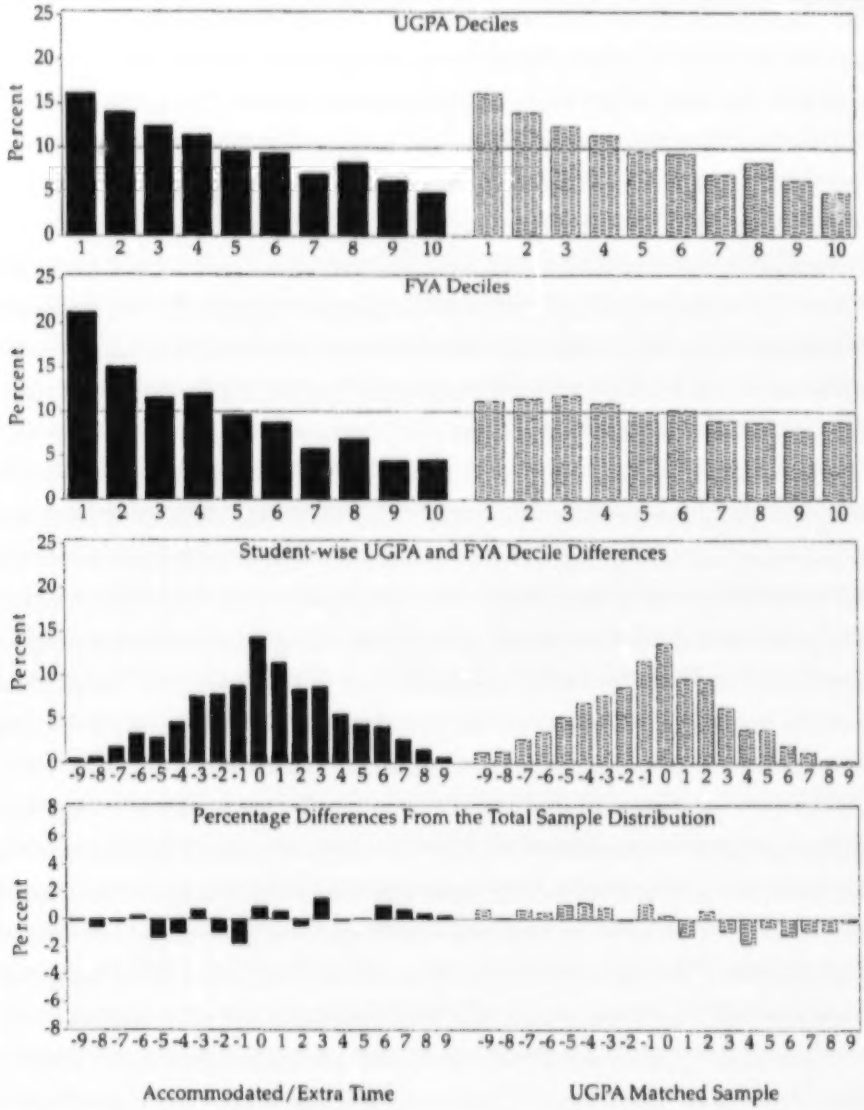

FIGURE 10. *UGPA versus FYA decile results for the accommodated/extra time sample (n = 1,249) and a UGPA decile matched sample (n = 1,249) of randomly drawn nonaccommodated sample students from the same classes. (Note that "differences" are calculated as UGPA decile minus FYA decile by student.)*

The results in Figure 11 suggest that index scores do only slightly better than LSAT scores at predicting the FYA standing of Accommodated/Extra Time sample students. Results for the related subgroups within the Accommodated/Extra Time sample are not presented here as they mirrored the results seen in Figures 9 through 11. In contrast, Figures 12 through 14 suggest that LSAT scores, UGPA, and index scores are doing a reasonably good job of predicting FYA standing for the Accommodated/Standard Time sample students.

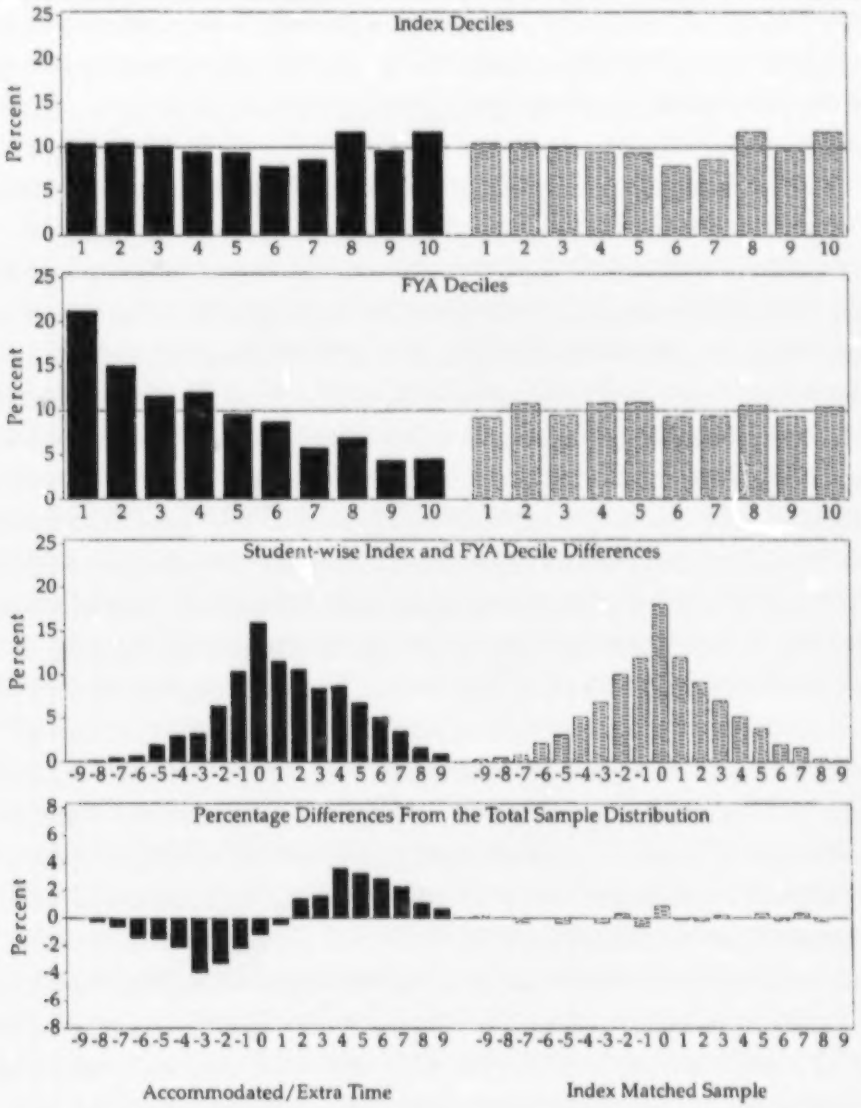

FIGURE 11. *Index versus FYA decile results for the accommodated/extra time sample (n = 1,249) and an index decile matched sample (n = 1,249) of randomly drawn nonaccommodated sample students from the same classes. (Note that "differences" are calculated as index decile minus FYA decile by student.)*

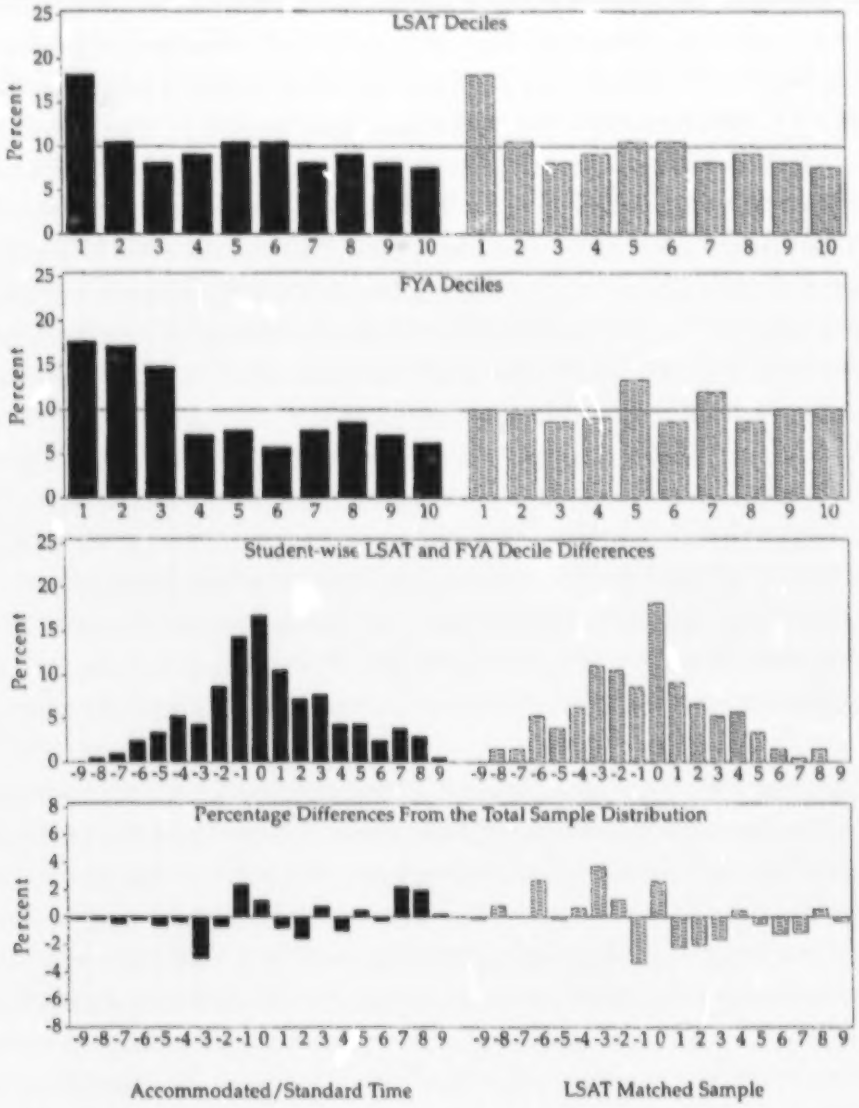

FIGURE 12. *LSAT versus FYA decile results for the accommodated/standard time sample (n = 209) and an LSAT decile matched sample (n = 209) of randomly drawn nonaccommodated sample students from the same classes. (Note that "differences" are calculated as LSAT decile minus FYA decile by student.)*

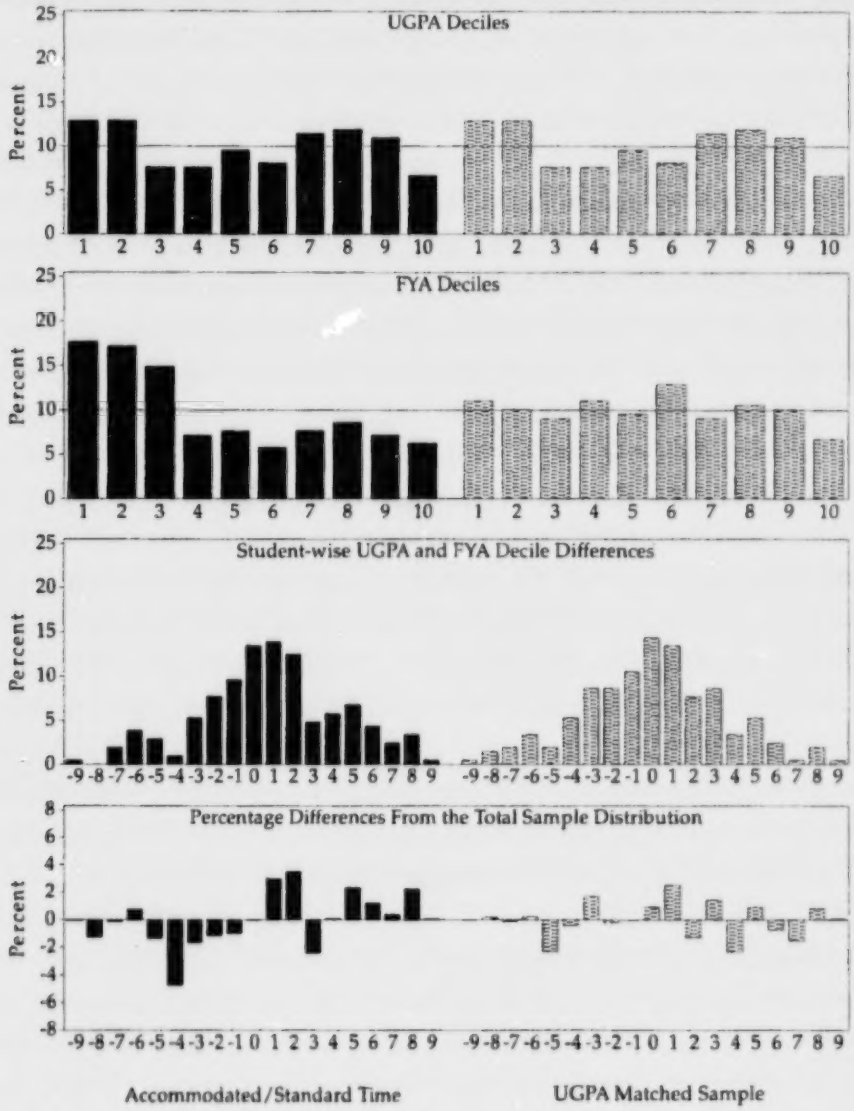

FIGURE 13. *UGPA versus FYA decile results for the accommodated/standard time sample (n = 209) and a UGPA decile matched sample (n = 209) of randomly drawn nonaccommodated sample students from the same classes. (Note that "differences" are calculated as UGPA decile minus FYA decile by student.)*

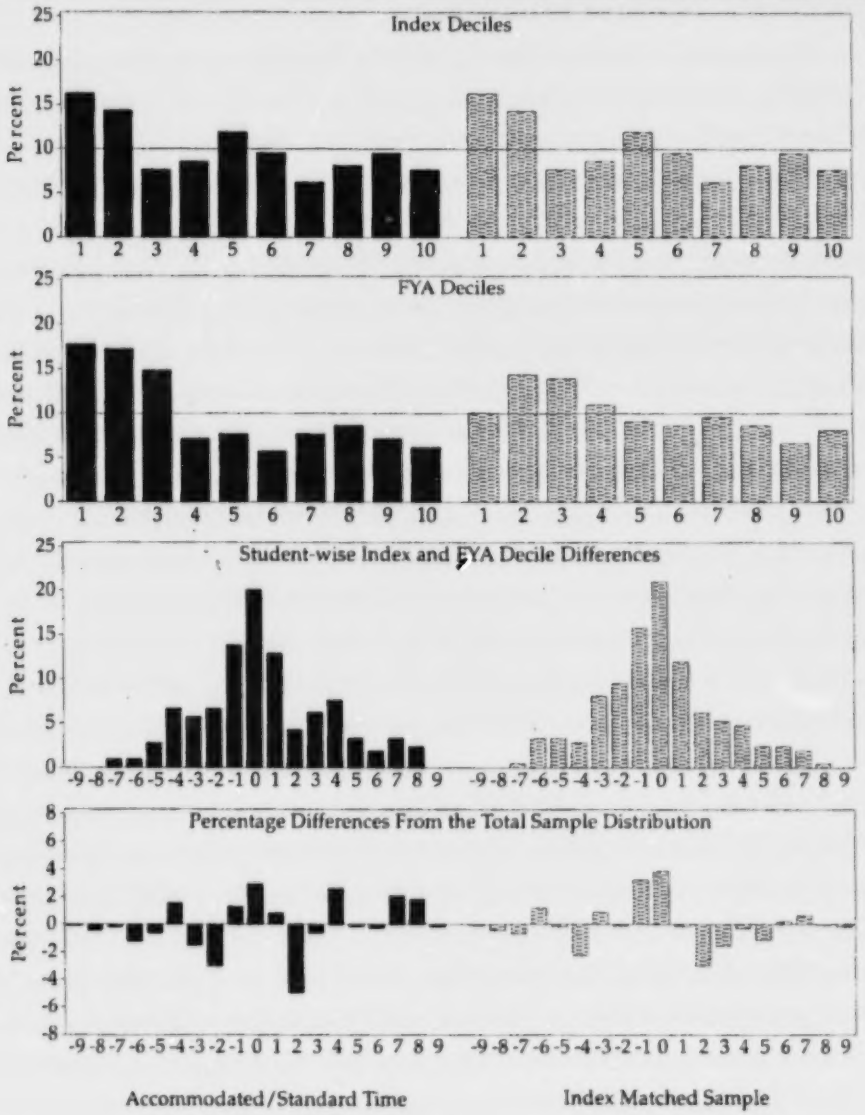

FIGURE 14. *Index versus FYA decile results for the accommodated/standard time sample (n = 209) and an index decile matched sample (n = 209) of randomly drawn nonaccommodated sample students from the same classes. (Note that "differences" are calculated as index decile minus FYA decile by student.)*

Matched Sample Analysis

Relationships between variables are best examined when samples can be randomly drawn and treatments randomly assigned. This ideal situation is rarely available in practical situations, and is certainly not possible for addressing the validity of LSAT scores obtained under accommodated conditions. First, whenever possible, law schools select students based on a variety of factors, and students ultimately select a law school based of a different, though possibly overlapping, set of factors. Second, test takers who receive accommodations are not normally interchangeable with test takers who test under standard conditions.

A common method for trying to address the potential extraneous effects nonrandom sample selection and nonrandom treatment assignments produce is to work with matched samples. In the previous section accommodated test takers were matched according to their particular entering class and decile rank with nonaccommodated test takers. This was done to first address concerns that the initial standing in a class alone may produce unintended effects. For example, if 100% of a particular subgroup fell in the top LSAT decile range, the ceiling effect would force any subsequent differences with FYA deciles to only be positive (i.e., these students could only go down). Second, the array of entering classes in which accommodated test takers are found might be different in some way from a randomly selected sample of entering classes, and if so, that effect of that difference might exhibit itself in the matched sample as it was drawn from the same entering classes.

While the matching done in the previous section was useful, it certainly did not address many of the differences between the samples. In order to account for as many differences as possible, a more extensive matched sample analysis was done. To accomplish this, an attempt was made to match every student in the Accommodated/Extra Time sample with a Nonaccommodated sample student under the constraint that they are:

- in the same entering class;
- of the same gender;
- of the same ethnicity;
- within three LSAT points of each other; and
- within .05 on the UGPA scale of each other.

If multiple matches were found, the Nonaccommodated sample student that came closest in terms of LSAT and UGPA credentials to the Accommodated/Extra Time sample student being matched was selected. As the counts in Table 6 indicate, matching simultaneously on all the constrains listed above was difficult. Of the 1,249 in the Accommodated/Extra Time sample, matches for only 771 were found. Fortunately, the distributions of subgroups within Accommodated/Extra Time sample and matched sample subset were similar (see Table 9 for related counts and percentages).

TABLE 9
Disability subgroup counts for the total and matched accommodated/extra time sample

	Accommodated/Extra Time Complete Sample		Accommodated/Extra Time Matched Sample	
Disability	Count	%	Count	%
ADHD	172	13.77	95	12.32
Hearing	6	0.48	4	0.52
Learning Disability	787	63.01	507	65.76
Neurological	99	7.93	60	7.78
Physical	22	1.76	12	1.56
Psychological	19	1.52	12	1.56
Visual	135	10.81	74	9.60
Other	9	0.72	7	0.91
Total	1,249		771	

Table 10 summarizes the statistical characteristics and prediction residuals for the matched sample. LSAT, UGPA, and index credentials are closely aligned between the matched halves, as was hoped for. Even so, the differences in FYA are large (i.e., almost a half a standard deviation on both the FYA and standardized FYA scales). Large differences in mean residuals are also evident and are reflected in the residual plots found in Figures 15 and 16.

TABLE 10
Matched sample statistical characteristics and residual analyses

Matched Group and Sample Size	Variable	Mean	SD	Scores Standardized within Class: Mean	Scores Standardized within Class: SD	Scores Standardized within Class: Correlation with FYA	Pooled Class Regressions: Mean Residual	Pooled Class Regressions: Standard Error
Accommodated / Extra Time	LSAT	158.32	7.08	0.29	0.85	0.29	5.20	0.34
N = 771	UGPA	3.16	0.40	-0.21	0.85	0.08	3.54	0.36
	INDEX	50.61	3.79	0.13	0.79	0.34	4.67	0.33
	FYA	45.95	9.80	-0.41	0.98	–	–	–
Nonaccommodated	LSAT	158.27	6.92	0.28	0.80	0.23	0.84	0.32
N = 771	UGPA	3.16	0.40	-0.21	0.84	0.16	-0.79	0.32
	INDEX	50.56	3.61	0.11	0.74	0.33	0.29	0.31
	FYA	50.26	8.95	0.03	0.89	–	–	–

Note. SD denotes standard deviation

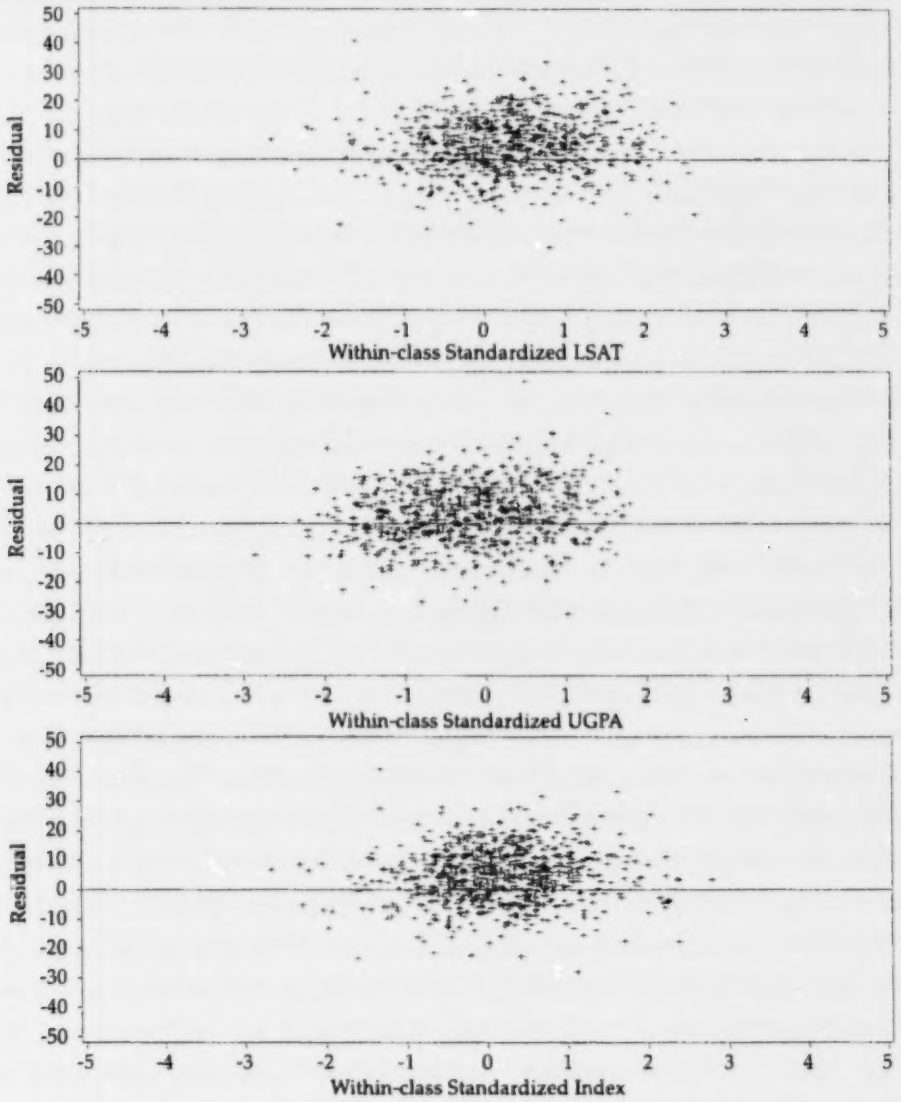

FIGURE 15. *Residuals (estimated FYA minus actual FYA) for the accommodated/extra time matched sample (n = 771) from three pooled-class regression models using within-class standardized LSAT, UGPA, and index as predictors*

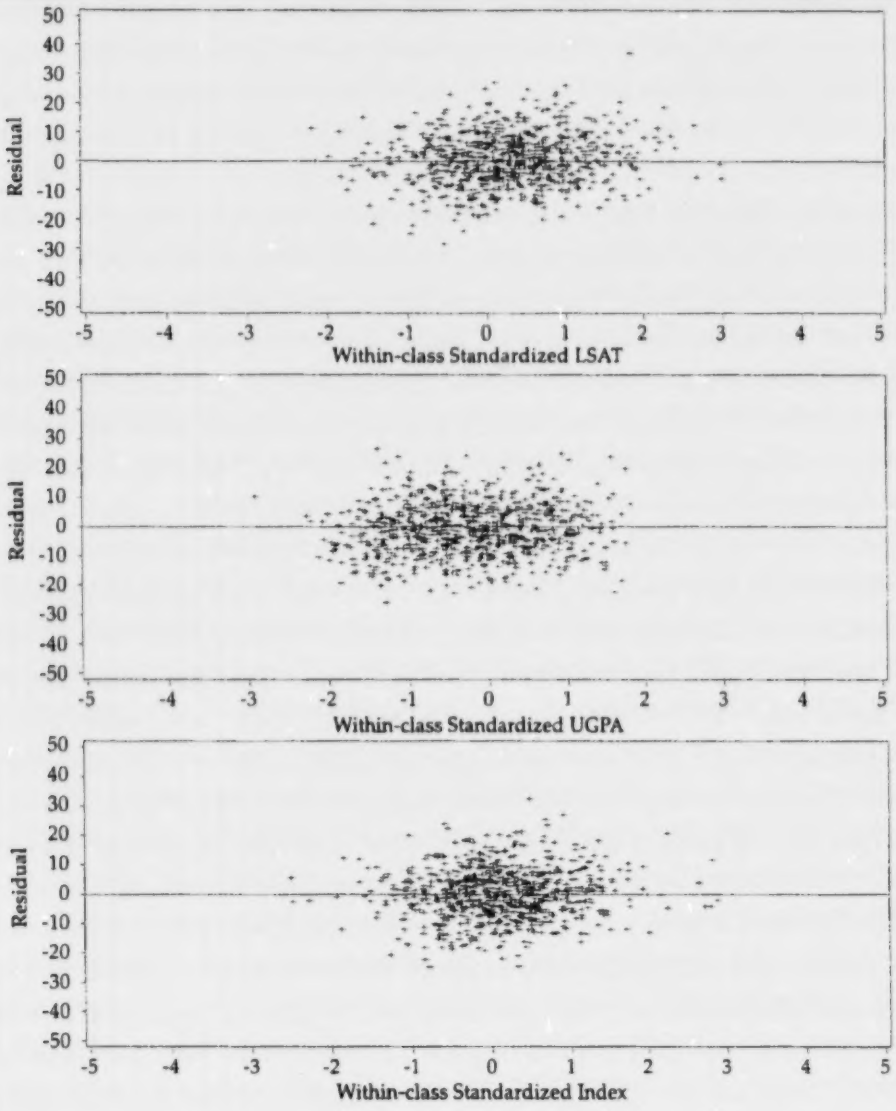

FIGURE 16. *Residuals (estimated FYA minus actual FYA) for the nonaccommodated matched sample (n = 771) from three pooled-class regression models using within-class standardized LSAT, UGPA, and index as predictors*

Decile analyses on the matched sample are provided in Figures 17 through 19. Results are similar to those found in the previous section for the Accommodated/Extra Time sample. Interestingly, some skewness is observable in the LSAT and FYA decile differences plot in Figure 17 for the Nonaccommodated matched sample. Minor skewness is also evident in Figure 18 within the UGPA and FYA differences plot for this sample, but in the opposite direction. As evident in Figure 19, the compensatory nature of the index seems to have eliminated these small differences.

One could conjecture that these small traces of skewness found in opposite directions for the Nonaccommodated matched sample could have been induced by the matching process. It is known that the Accommodated/Extra Time sample have unusually discrepant LSAT versus UGPA credentials. Finding matches for them may result in a selection of Nonaccommodated sample students whose LSAT score and UGPA are consistently above and below their "true" LSAT score and "true" UGPA, respectively.

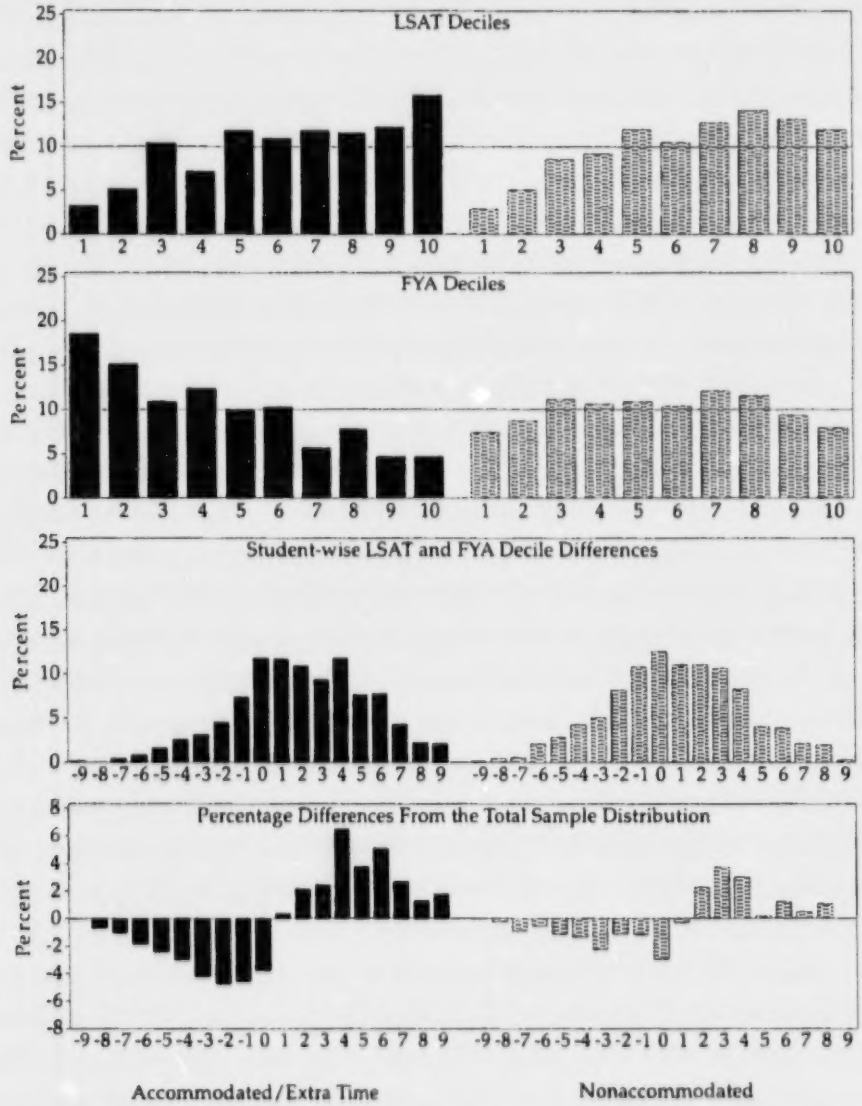

FIGURE 17. *LSAT versus FYA decile results for the accommodated/extra time matched sample (n = 771) and the nonaccommodated matched sample (n = 771). (Note that "differences" are calculated as LSAT decile minus FYA decile by student.)*

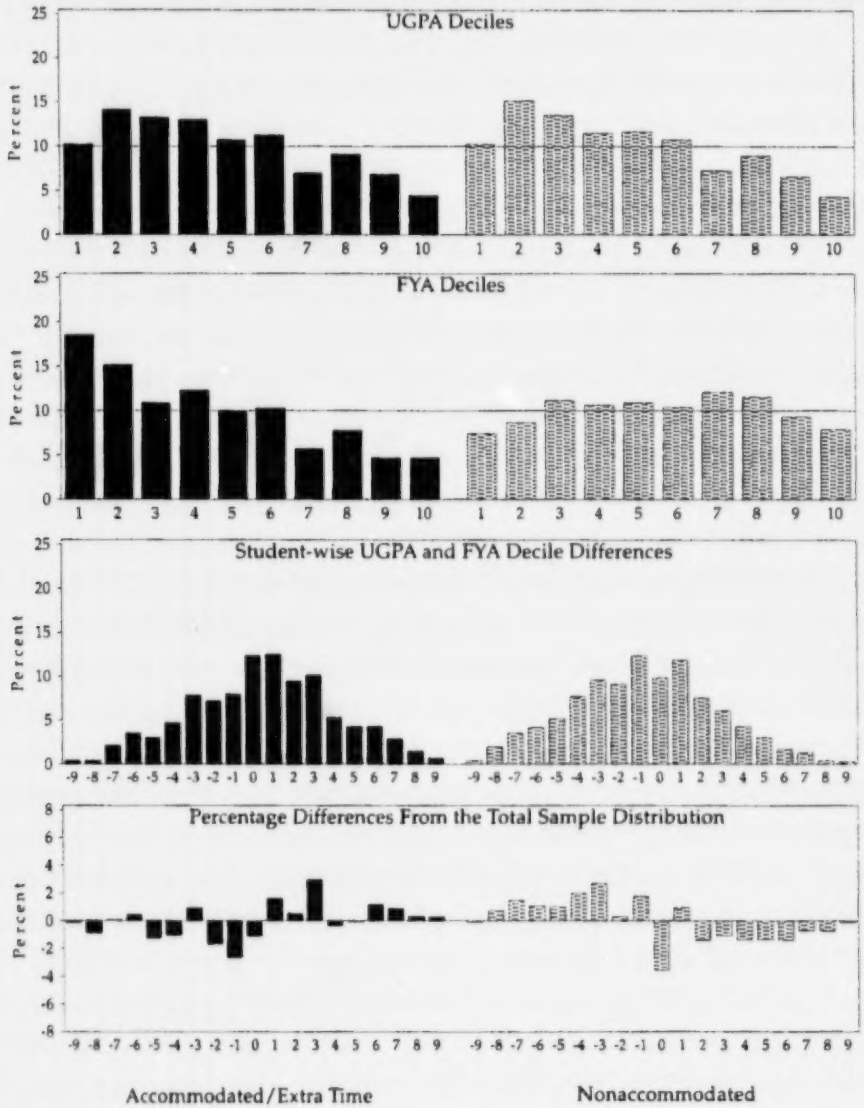

FIGURE 18. *UGPA versus FYA decile results for the accommodated/extra time matched sample (n = 771) and the nonaccommodated matched sample (n = 771). (Note that "differences" are calculated as UGPA decile minus FYA decile by student.)*

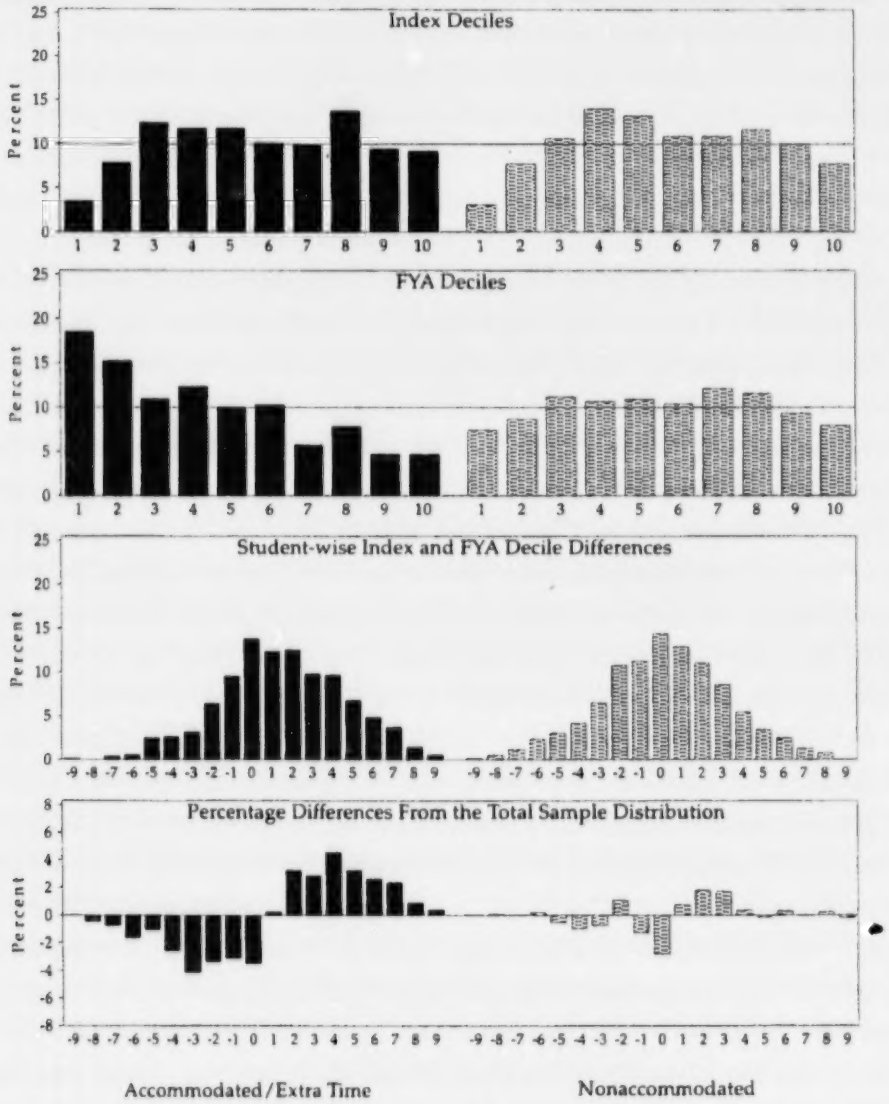

FIGURE 19. *Index versus FYA decile results for the accommodated/extra time matched sample (n = 771) and the nonaccommodated matched sample (n = 771). (Note that "differences" are calculated as index decile minus FYA decile by student.)*

Conclusions

Caution should always be exercised when drawing conclusions from the type of data analyzed in this study. While the overall sample sizes were fairly reasonable, the students of particular interest were spread sparsely across 590 entering classes. This meant that analyses involved pooling results across entering classes. Some comfort can be drawn from the fact that the pooled results closely reflect those of the within-class correlation studies that are done annually.

Another potential problem relates to the fact that the groups studied do not constitute random samples. When possible, law schools choose which students they wish to admit and prospective students choose which law school they prefer to attend. Fortunately, the matched sample analysis undertaken in this study indicated that the student/law school selection process was probably not solely responsible for the results found for the unmatched samples.

Finally, the range of scores available for study was restricted due to the selection process alluded to above. The range of entering class LSAT scores, for example, is typically quite narrow at many law schools. Fortunately, the strength of correlations between predictor and criterion variables was not of prime concern in this study, but rather whether the criterion variable FYA was systematically over- or underpredicted (i.e., estimates of FYA based on predictor variables were on average higher or lower than actual FYAs, respectively). Also, various complementary analyses were conducted to supplement the regression modeling approach that is usually undertaken to assess over- or underprediction.

Even if some of the effects observed in this study can be attributed to sampling artifacts, the results still strongly suggest that LSAT scores obtained under accommodated conditions that include extra testing time are not comparable to LSAT scores obtained under standard time conditions. In particular, accommodated with extra time LSAT scores tend to overpredict law school performance as measured by first-year averages. This finding of overprediction is consistent with those found by Wightman (1993b) for the LSAT and by various researchers for other large-scale standardized tests (e.g., Braun, Ragosta, Kaplan, 1986a, 1986b). With larger sample sizes than were available in the Wightman study, this current study was able to illustrate how pervasive this overprediction may truly be.

More specifically, the overprediction phenomenon observed did not seem to be confined to one segment of the LSAT scale, but rather spanned the range of LSAT scores for law school students who received LSAT accommodations that included extra time. This finding counters a possible argument that the overprediction observed for this group was due in large part to a statistical modeling artifact (e.g., a regression effect due to the relative unreliability of the predictor variables).

In addition, relative to others in their entering class, the ranked standing of these students with regard to their first-year performance tended to be substantially lower than their ranked standing with regard to their LSAT score. A similar result was found for their index score, but this phenomenon was not as evident for their entering class UGPA ranked standing. Given this finding, a case might be made that UGPAs are better predictors of law school performance relative to accommodated with extra time LSAT scores or related index scores, despite the facts that for this group: (1) the former exhibited a lower correlation with FYA than did the latter two predictors; and (2) UGPA appeared to overpredict FYA only slightly less than the other two predictors. More data and further analyses are required, however, before specific conclusions could be drawn along these lines.

No substantial differences with regard to the findings cited above were observed among the four disability categories for which reasonable sample sizes existed (i.e., the Attention Deficit/Hyperactivity Disorder, Learning Disability, Neurological Impairment, and Visual Impairment subgroups).

In contrast, no substantial evidence was found to suggest that LSAT scores obtained under accommodated conditions that did not include extra testing time (i.e., under standard time conditions) are not comparable to nonaccommodated LSAT scores. While such scores tended to overpredict first-year law school performance, the amount of overprediction was about half as much as was observed for scores obtained under extra time conditions. In addition, the LSAT credentials of these students (i.e., those accommodated without extra time) were more in line with their first-year law school performance with regard to their respective entering class ranked standing.

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